National Aeronautics and Space Administration

NASA's John C. Stennis Space Center

Mission Brochure

National Aeronautics and Space Administration

John C. Stennis Space Center
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stennis space center

1961-2011

50 years of powering dreams

message

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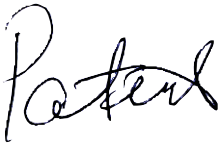
John C. Stennis Space Center
Director Patrick Scheuermann

The story of NASA's John C. Stennis Space Center is fascinating and unique. Built out of harsh south Mississippi terrain in the early 1960s, the facility has grown into the nation's premier rocket engine test site and has powered America's space dreams and adventures for five decades.

Stennis engineers tested rocket engines that carried humans to the moon and propelled every space shuttle crew on their 135 different missions. That work and story continues as Stennis tests NASA and commercial rocket engines that will carry the nation into space on new and unprecedented explorations for years to come.

Stennis also has become a leader in NASA's Applied Sciences Program with its frontline work on Gulf of Mexico issues and has grown into a model federal city, home to more than 30 government, academic and private organizations and technology-based companies. The entities share the cost of owning and operating Stennis, making it more cost-effective and efficient for them to accomplish their independent missions and positioning Stennis as a true economic engine for its region.

The story of Stennis is one of great dreams realized – and even greater dreams to come. Wherever this nation flies in space, whatever worlds it explores and however many adventures its undertakes into the cosmos, it will do so on the shoulders of men and women at Stennis Space Center – where space dreams really do find the power to fly!



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overview

stennis space center

For more than four decades, John C. Stennis Space Center in south Mississippi has served as NASA's primary rocket propulsion testing ground. Today, the center provides propulsion test services for NASA and the Department of Defense, as well as the private sector. It is home to NASA's Rocket Propulsion Test Program, which manages all of the agency's propulsion test facilities.

State-of-the-art facilities, a seven-and-one-half-mile canal waterway system and the 125,000-acre acoustical buffer zone that surrounds Stennis enable delivery and testing of large-scale rocket engines and components.

Stennis was established in the 1960s to flight-certify all first and second stages of the Saturn V rocket for the Apollo manned lunar landing program. From 1975 to 2009, the center's primary mission was to test the main engines that propelled the space shuttle during its eight-and-one-half-minute ascent to orbit.

With NASA's Space Shuttle Program ended, Stennis now is preparing to test RS-25D/E and J-2X engines that will be used on NASA's new heavy-lift Space Launch System. NASA also has announced the agency will partner with commercial interests in providing space travel and transportation, and Stennis already is working with commercial companies to supply their rocket propulsion testing needs. For example, the center has partnered with Orbital Sciences Corporation to provide testing of the AJ26 Aerojet rocket engines that will be used to power the Taurus II on commercial cargo transport flights to the International Space Station.

Stennis' state-of-the-art test facilities include the A, B and E complexes, which enable testing of components, full-scale engines and rocket stages, as well as future-generation engines. An A-3 Test Stand also is under construction to conduct simulated high-altitude testing on engines. Such testing is critical for engines that will carry humans into deep space.

Stennis' Applied Science and Technology Project Office uses NASA-generated science research, remote sensing and other technical capabilities to help partner agencies, such as the Federal Emergency Management Agency and the U.S. Department of Agriculture, make more informed decisions. For instance, Stennis scientists use remote sensing technologies and their expertise in rapid prototyping to expand and improve hurricane prediction capabilities. They also focus on coastal management, an important consideration for the entire Gulf Coast region and one of NASA's national science priorities.

Through the Office of the Chief Technologist and NASA's Innovative Partnership Program, engineers and researchers at Stennis work to transfer NASA-developed technologies to the commercial sector to help improve the economic strength of the United States and the quality of life for its citizens. These efforts include research and development of new technologies, as well as the assessment, certification and acquisition of new and useful technologies from the commercial, academic and government sectors that improve the safety, efficiency and effectiveness of propulsion testing, Earth science applications and Stennis Space Center.

Since 2006, Stennis also has been the home for the NASA Shared Services Center. The facility provides the national agency with centralized administrative processing services and customer contact center operations for support of human resources, procurement, financial management and information technology. The work performed by the center frees agency resources that can then be redirected to NASA's core mission.

Stennis Space Center is home to a number of federal, state, academic and private organizations and several technology-based companies that share the cost of owning and operating the facility, making it more cost-effective for each agency to accomplish its independent mission.

The Naval Meteorology and Oceanography Command, the largest concentration of oceanographers in the world, is headquartered at Stennis, along with the Naval Research Laboratory, the Navy's corporate laboratory. Stennis also is the riverine warfare training ground for the Department of Defense's Special Boat Team TWENTY-TWO, the headquarters of the Naval Small Craft Instruction and Technical Training School and Naval Oceanography Mine Warfare Center. In addition, it is home to the Lockheed Martin Mississippi Space and Technology Center, the Rolls-Royce North America Outdoor Jet Engine Testing Facility and the Pratt & Whitney Rocketdyne rocket engine assembly facility.

With its effective cost-sharing philosophy, state-of-the-art test facilities, highly-trained and professional workforce, and commitment to safety and customer satisfaction, Stennis is a model of government efficiency, providing American taxpayers positive returns on their investments.

NASA has a workforce of more than 2,000 civil servants and contractors, part of the center's total workforce of 5,000-plus. The center has a strong influence on the economy of surrounding communities.

Its community involvement includes participation in the Combined Federal Campaign fundraising drive, hosting the area's annual Special Olympics, support of the annual Feds Feed Families food drive and conducting educator workshops.

The StenniSphere visitor center offers free tours of America's largest rocket engine test complex. StenniSphere displays include the Science on a Sphere exhibit and various artifacts, including a moon rock, a space shuttle main engine, an Apollo command module and an Apollo Saturn V engine.

history

stennis space center

When President John F. Kennedy made his historic 1961 announcement that the United States would put humans on the moon by the end of that decade, a site was needed to test the powerful engines and rocket stages that would propel them on their journey.

For NASA officials, the rough terrain of Hancock County, Miss., provided the five things necessary to test the large Apollo engines and stages: a site isolated from large population centers, water and road access for transportation needs, available public utilities, nearby supporting communities and a climate conducive to year-round engine testing. In May 1963, workers felled the first tree in a daunting construction project. The effort marked the largest construction project in the state of Mississippi and the second largest in the United States at that time.

Despite a pressing schedule, occasional setbacks and even the disruption of Hurricane Betsy in 1965, construction workers toiled day and night to prevail in their tasks. On April 23, 1966, just three years after the first tree was felled and construction began, a Saturn V second stage prototype was test-fired on the A-2 Test Stand. With the shake, rattle and roar of the test, south Mississippi was blasted into the space age.

From 1967 until 1972, Stennis test-fired first and second stages of the Saturn V rocket for the Apollo Program. After the Apollo Program ended, Stennis Space Center was called on to test main engines for NASA's new reusable spacecraft, the space shuttle. After necessary modifications to the test structures, Stennis tested the first space shuttle main engine on the A-1 Test Stand on May 19, 1975.

For the next 34 years, Stennis and major contractor Pratt & Whitney Rocketdyne would continue to test every engine used to power the shuttle spacecrafts into orbit on 135 missions. In that time, not a single mission failed because of engine malfunction.

In May 2007, NASA announced construction of a new test stand at Stennis Space Center to test the next-generation J-2X rocket engine that will power the upper stage of NASA's new heavy-lift space launch system. With plans to travel beyond low-Earth orbit, the J-2X engine must be able to start in space. To test that capability, the new 300-foot-tall, open-steel-structure A-3 Test Stand will use a series of chemical steam generators to simulate altitudes of up to 100,000 feet for testing the engine. The stand is scheduled for activation in 2013.

Now the nation's largest rocket engine test facility, Stennis continues to build on its rich history in support of American space exploration. As it celebrates its 50th anniversary, a saying from decades earlier still is true – wherever America goes in space, it will fly there on engines tested at Stennis Space Center.

Photos: (Page 6) A 1965 photograph shows the B-1/B-2 Test Stand (foreground) and the A-2 Test Stand under construction at Stennis Space Center. (Page 7) A 2009 aerial photograph shows the B-1/B-2 Test Stand (foreground) at Stennis Space Center, with the facility's A Test Complex and its A-1, A-2 and A-3 test stands all visible.

propulsion testing

stennis space center

Established in the early 1960s, John C. Stennis Space Center has grown into the nation's largest and premier rocket engine test facility. The center is home to NASA's Rocket Propulsion Test Program Office, the principal implementing authority for the agency's rocket propulsion testing. The agency office manages NASA rocket propulsion test facilities located at Stennis Space Center; Marshall Space Flight Center in Huntsville, Ala.; Johnson Space Flight Center/White Sands Test Facility in Las Cruces, N.M.; and Glenn Research Center/Plum Brook Station in Sandusky, Ohio.

At Stennis, the Engineering and Test Directorate conducts propulsion test activities on one-of-a-kind facilities collectively valued at more than $2 billion and dubbed national assets. State-of-the-art facilities include the A, B and E complexes, where rocket propulsion tests can be conducted on engine components, full-scale engines and even rocket stages.

The A Test Complex at Stennis Space Center consists of two single-position, vertical-firing test stands designated A-1 and A-2, both built in the 1960s. The stands have been used to conduct full flight-stage and engine component tests, as well as single-engine tests at sea level and simulated altitudes. They now are being used to test next-generation J-2X rocket engines and components being built to carry humans into deep space once more.

In addition, for the first time since the 1960s, a large test stand is being built at Stennis to provide simulated high-altitude testing of next-generation rocket engines. The 300-foot-tall A-3 Test Stand will allow operators to conduct tests at simulated altitudes up to 100,000 feet. The feature is important because if humans are to explore past low-Earth orbit, they must have rocket engines that will fire in space.

NASA at Stennis Space Center also is heavily involved in testing rockets for the nation's commercial launch sector. RS-68 engine testing continues in support of the United Launch Alliance Delta IV expendable launch vehicle. Testing for Orbital Science Corporation's Taurus II booster engine, the Aerojet AJ26, began in 2010. Those engines will be used to power commercial cargo flights to the International Space Station.

A Saturn S-IC-5 rocket stage is test fired on the B-2 Test Stand at Stennis Space Center for the first time on Aug. 25, 1967.

The B Test Complex consists of a dual-position, vertical, static-firing test stand designated B-1/B-2, also built in the 1960s. First stages of the Apollo Saturn V rocket were static fired at the test stand from 1967 to 1970. Stennis now leases the B-1 test position to Pratt & Whitney Rocketdyne for testing of the RS-68 engine.

The E Test Complex was constructed in the late 1980s and early 1990s. This versatile, three-stand complex includes seven separate test cells capable of supplying ultra high-pressure gases and cryogenic fluids, using a variety of rocket propellants. The E-1 Stand is used to test Orbital's AJ26 engines.

Various infrastructures support the test complexes. Stennis test stands are linked by a seven-and-one-half-mile canal system used primarily for transporting liquid propellants. Additional features of the test complex include test control centers, data acquisition facilities, a large high-pressure gas facility, an electrical generation plant, and a high-pressure industrial water facility served by a 66-million gallon reservoir.

applied science

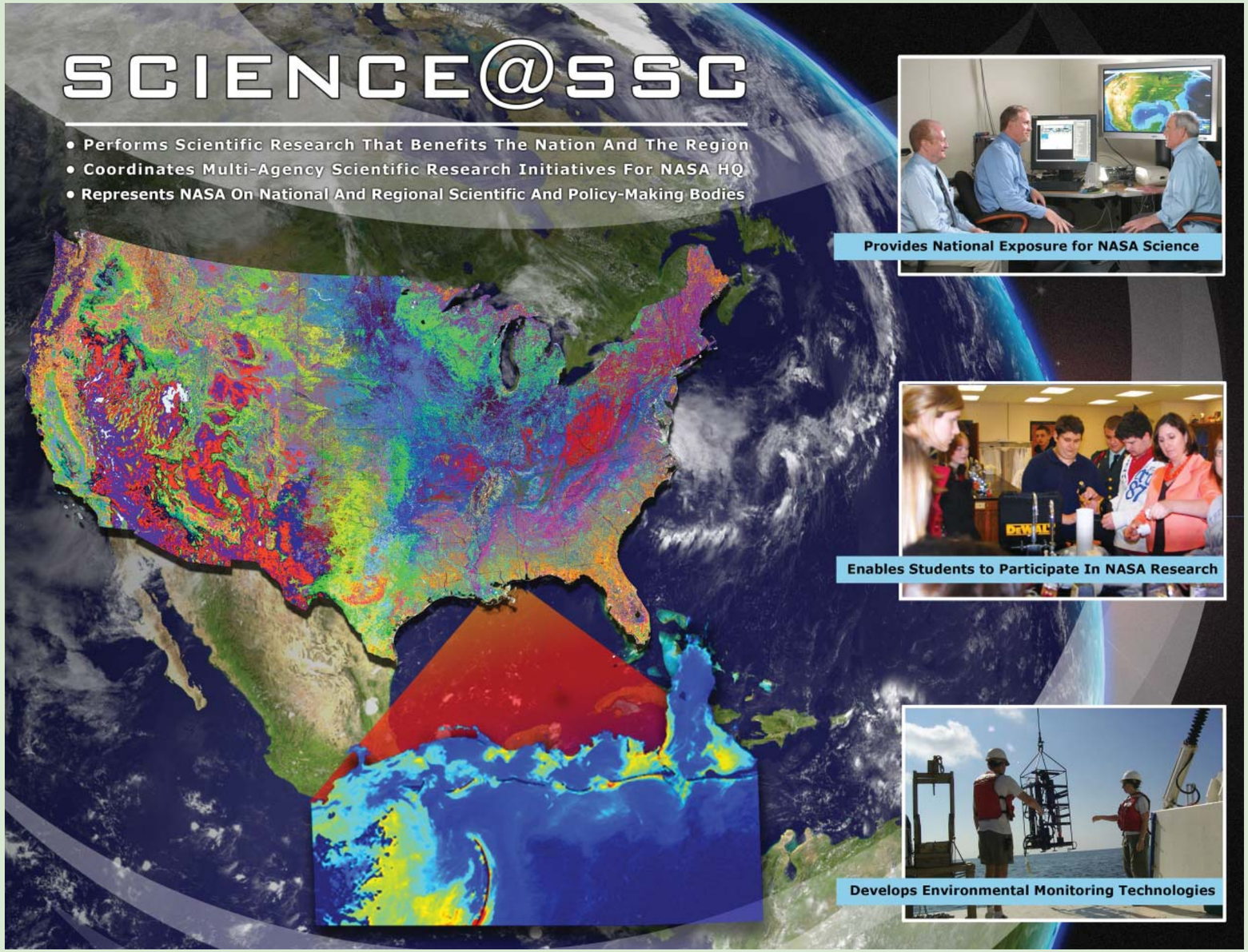
stennis space center

The Applied Science & Technology Project Office (ASTPO) at Stennis Space Center works on the front lines of science and engineering to make a meaningful, beneficial impact on the world.

ASTPO works with community partners to demonstrate how Earth science research can help respond to crises, establish sustainable policies, and address societal issues. Using expertise in remote sensing, oceanography, land use/land cover analysis, signal processing, electronics, and mathematical modeling, ASTPO conducts scientific research, creates new tools and techniques to monitor the environment, and generates information to help leaders make informed decisions.

In 2007, NASA formed the Gulf of Mexico Initiative to help the Gulf region recover from the devastating hurricanes of 2005 and to address coastal management issues of the future. ASTPO oversees this initiative, which employs hundreds of scientists and engineers across the country to address high priority issues defined by the Gulf of Mexico Alliance, a regional collaboration of 13 federal agencies and the five states bordering the Gulf of Mexico. Priority topics include water quality, wetland and coastal conservation and restoration, sediment management, coastal ecosystems and environmental education.

ASTPO helps the Gulf region respond to disasters such as the Deepwater Horizon oil spill, tornadoes and flooding. When the Morganza and Bonnet Carré spillways were opened in 2011 to prevent Mississippi River flooding in Baton Rouge and New Orleans, ASTPO mapped the flooding in the Atchafalaya River basin and the nutrient-rich sediment plumes flowing into the Gulf. When a super cell spawned dozens of tornadoes across the southeastern United States in April 2011, ASTPO used satellite data to identify tornado tracks and areas heavily damaged by the storms.



During the Deepwater Horizon oil spill, ASTPO acquired data to understand the impact of the spill on the barrier islands, collected various samples to evaluate oil spill mitigation and remediation technologies, and helped coordinate NASA and state operations to detect the oil slick and understand its impact on critical habitats.

ASTPO researchers use data from multiple satellites, aircraft, buoys, monitoring stations and computer models to observe coastal marshes, barrier islands, estuaries, fields and forests; to detect threats to critical habitats; and to evaluate conservation, restoration and management strategies. Working with local, state and federal partners, ASTPO scientists address problems across the Gulf and apply the lessons learned to issues throughout the nation and around the world.

In all ASTPO efforts, the goal is clear: use NASA expertise to solve real-world problems.

spinoffs

stennis space center

Most people do not think of NASA as they watch a major golf tournament or load computer software or select baby food flavors or listen to a news update about land mine removal in a distant country.

They should. Through a variety of spinoff technologies, the American space agency has contributed to all of those areas of everyday life – as well as many, many more.

A NASA "spinoff" refers to space-related technology that has been commercialized with NASA funding, research and/or assistance. NASA spinoffs can be traced to matters as diverse as artificial limbs, heart pumps, anti-icing systems for airplanes, food safety, golf club design, firefighting gear, enriched baby, food safe land mine removal and water purification.

Many of the spinoffs are developed through NASA's Innovative Partnerships Office, which is part of the agency's Office of the Chief Technologist. At Stennis, the Mississippi Enterprise for Technology and the Louisiana Business & Technology Council also help companies work with NASA on spinoff possibilities.

Find NASA in your home and everyday world by visiting: www.nasa.gov/city/

Stennis and Stennis-related companies already have partnered to produce valuable spinoffs. When NASA celebrated its 50th anniversary by naming its top 50 spinoffs technologies, Stennis posted two on the list – development of a one-of-its-kind arbitrary shape deformation (ASD) software capability to aid designers and development of the Earth Resources Laboratory Applications Software (ELAS) used worldwide for processing satellite and airborne imagery data into readable and usable information.

Recently, Stennis teamed with a local company to develop a state-of-the-art Real-time Emergency Action Coordination Tool (REACT). The system incorporates maps, reports, Internet-driven data and real-time sensor input into a geographical information system (GIS)-based display to provide comprehensive information during emergency and disaster situations. This allows organizations and officials to collaborate on a coordinated response during events. The REACT system has proven so effective that it has been adopted in all NASA centers and by various area communities.

All in all, NASA spinoffs have contributed greatly – and continue to contribute greatly – to everyday life in ways that few realize.

outreach

stennis space center

Stennis Space Center conducts a variety of outreach activities aimed at informing and educating the public about the nation's space program and the range of work performed at the facility to support that mission.

StenniSphere, the visitor center, conducts regular public tours. StenniSphere staff members also support special events throughout the region to provide information and hands-on activities for adults and children alike.

NASA's Speakers Bureau Program at Stennis regularly provides scientists, engineers and other employees for lectures and presentations to civic groups and schools along the Mississippi Gulf Coast and throughout southeast Louisiana. Topics of interest include space shuttle main engine testing work, aerospace engineering, propulsion systems technology, remote sensing applications, technology transfer, the benefits of the space program spinoffs in society, NASA education programs and the economic impact of Stennis Space Center.

Members of the media are frequent visitors to Stennis Space Center, and the facility periodically hosts an open house for the general public. In addition, the 72,000-square-foot INFINITY at NASA Stennis Space Center facility is under construction to provide a state-of-the-art look at the work under way at Stennis. When it opens, visitors will see that the state of Mississippi is home to one of the most interesting, exciting workplaces in the world.

education

stennis space center

There is no mistaking the goal of the Stennis Education Office – to inspire and enable a new generation of science, engineering and space leaders. To that end, the Stennis education team focuses squarely on promoting science, technology, engineering and mathematics (STEM) training, learning and careers. The aim is emphasized and advanced through a variety of efforts and initiatives.

Each year, the Stennis Education Office sponsors weeks and weekends of space-related camps for children and young people through its Astro Camp and Astro STARS programs. All of the sessions use hands-on activities to teach math and science principles and explore science and space-related career possibilities. The goal of the camps is to spark children's imaginations about space exploration in the hope that they choose to take part in America's vision to explore worlds beyond this one.

In addition, the Stennis office provides annual support to FIRST® LEGO® and FIRST® Robotics activities, which have proven an invaluable training ground for students. The education team provides funding, judges, mentors and volunteers for the annual student competitions.

The Stennis office also sponsors a variety of teacher workshops throughout the years, all geared toward introducing educators to available NASA resources and equipping them to use the teaching tools in their classrooms. The workshops are held both on-site and at off-site locations throughout the Louisiana-Mississippi region.

For higher education students and teachers, the Stennis Education Office offers a wide range of fellowship, internship and study programs. All involve STEM activities and place a heavy emphasis on introducing participants to real-life research and work environments.

In the past two years, the Stennis education team has widened its focus considerably by producing a trio of curricula that are available electronically for use in classrooms around the world. The curricula focus on such topics as explaining mass and weight to students, using sports to explain Newton's Laws of Motion and exploring nutrition-related issues by examining food in space. The curricula have been widely acknowledged, with the Mass vs. Weight materials even supported by a live video feed that gave local students a chance to talk to astronauts aboard the orbiting International Space Station and ask them questions about living in space.

In addition to annual scheduled events, the Stennis education team supports a wide variety of special events each year, providing hands-on demonstrations and presentations. For instance, in 2011, team members traveled to New York City, where they teamed with peers from other NASA centers for a daylong event offering exhibits, interactive displays and presentations to an estimated 4,000 visitors. Team members also partner regularly with local schools on special projects, all intent on inspiring students to pursue studies and careers that will make them supporters and leaders of the American space program of tomorrow.

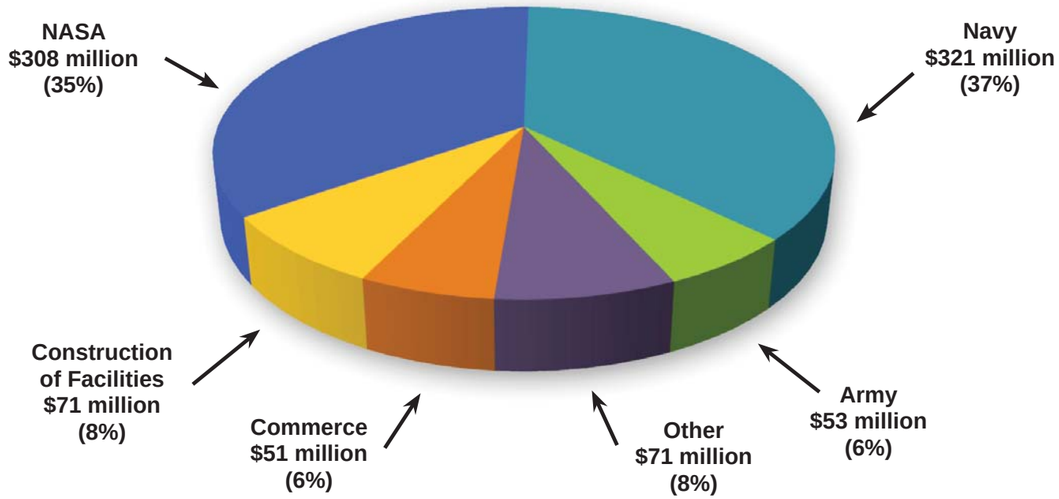
Photos: (Page 14) Louisiana and Mississippi science teachers build undersea Sea Perch robots during an educator workshop co-sponsored by the Stennis Education Office. (Page 15) NASA Administrator Charles Bolden speaks to a group of elementary students during a 2009 visit to the Mississippi Gulf Coast.

The top of the B-1/B-2 Test Stand offers a panoromic view of an Aug. 17, 2011, test firing of the next-generation J-2X rocket engine on the A-2 Test Stand. In the background are the A-3 Test Stand (left), the E Test Compex (center) and the A-1 Test Stand (right).

economic impact

stennis space center

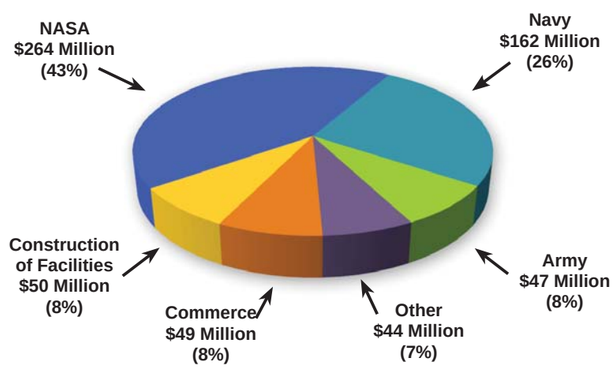
Direct Global Economic Impact – $875 Million



Direct Economic Impact 50-mile Radius – $616 Million

If Stennis had not been in operation in 2010, a very conservative estimate of reduction in employment for the local area would be almost 23,000 jobs; personal income would have been reduced by $1.03 billion; and retail sales would have been reduced by $617.5 million. It is estimated Stennis had an impact of $110.2 million on local government tax revenue in 2010.

**Study by Dr. Charles A. Campbell, professor of economics, Mississippi State University, February 2011.*

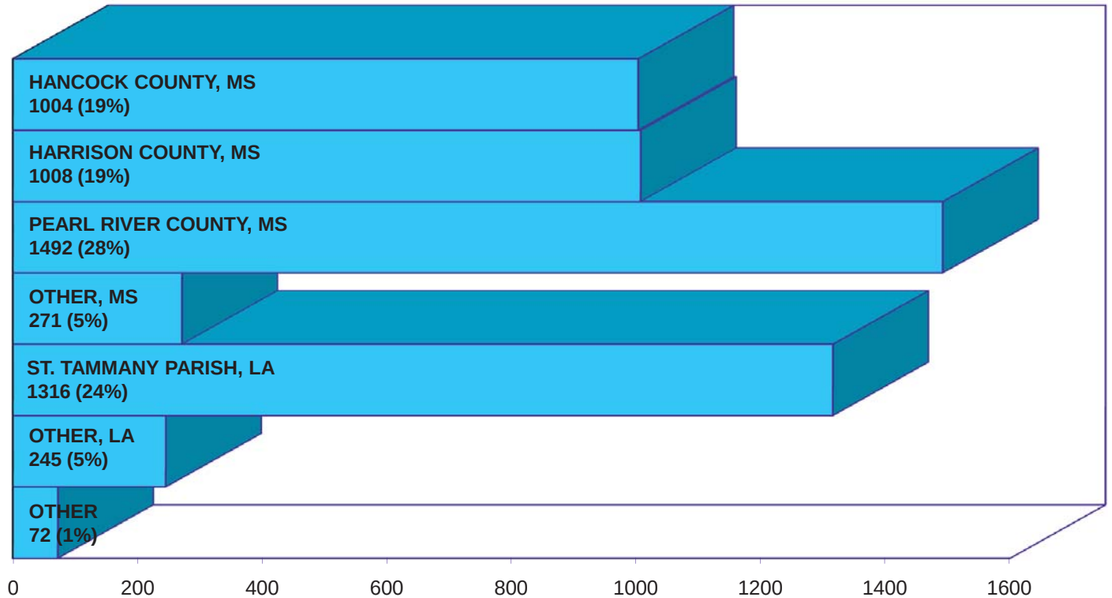


Workforce*

- NASA and contractors – 2,203
  (Stennis federal civil servants, 414; contractors and other, 1,789)
- Department of Defense and contractors – 2,489
  (Department of Navy and contractors, 2,138; Department of Army and contractors, 351)
- Department of Commerce and contractors – 240
- Other Resident Agencies – 476

*Totals as of Sept. 30, 2010

Residential Distribution of Stennis Personnel



Employee Skills

- Scientific/Technical – 34%
- Business/Professional – 24%
- Technical/Crafts/Production – 22%
- Clerical – 6%
- Other – 14%

Education Levels (All Employees)

- Doctorate – 5%
- Masters – 16%
- Bachelors – 33%
- Associates – 11%
- Some College – 15%
- High School Diploma– 19%
- Other – 1%

stenniSphere

stennis space center

Looking for a space adventure? Check out StenniSphere, the visitor center and museum at John C. Stennis Space Center, featuring 14,000 square feet of informative displays and exhibits from NASA and other agencies.

Visitors to StenniSphere board buses for a 25-minute narrated tour, beginning at the Launch Pad station at the Hancock County Welcome Center at Interstate 10 Exit 2 in south Mississippi. At the Launch Pad is a 30-foot-tall lunar lander used as a trainer by Apollo astronauts. Its base features the autograph and bootprints of Fred Haise, an Apollo 13 astronaut and Mississippi native. From the Launch Pad, tours proceed to the site of America's largest rocket engine test complex for an up-close view of the massive test stands and perhaps the shake, rattle and roar of a rocket engine as it is tested.

Once at StenniSphere, visitors find numerous exhibits, such as a moon rock, the Science on a Sphere interactive display and the Apollo 4 Command Module.

In the mock control center, visitors can conduct a "test" of a space shuttle main engine and "launch" a rocket. In the space shuttle cockpit display, they can try their hand at "landing" the space vehicle. A full-scale International Space Station mock-up offers a look at a habitation and laboratory module.

"Swamp to Space" presents the history of the center and information on the local environment. "Evolution of Space Flight" offers a pictorial history highlighting America's space program. The Naval Meteorology and Oceanography Command offers a weather center, a representation of the ocean floor and information on Earth's oceans. "Caring for the Gulf Together" shows how Stennis agencies support preservation of the Gulf of Mexico. "NASA's Technology: an Investment in America's Future" reviews how space exploration has led to technological advances for everyday life.

Outdoors, visitors are able to see a space shuttle main engine, a Learjet Model 28 airplane equipped with remote sensors to gather detailed images of Earth, a full-scale Nomad buoy like those used to measure weather and ocean conditions, a scale model of the Saturn V rocket that took America's astronauts to the moon, an F-1 engine that powered the first stage of the Saturn V rocket, and a solid rocket booster that helped power the space shuttle into orbit.

Visitors also can enjoy the Rocketeria, a space-themed 1960s-style restaurant, or browse the Space Odyssey Gift Shop for "right stuff" souvenirs.

StenniSphere conducts public tours from 10 a.m. to 3 p.m. Wednesday through Saturday, except major holidays, with the last tour leaving the Launch Pad at 2 p.m. Group tours may be booked to visit Tuesday through Saturday. To make reservations, call 1-800-237-1821. Visitors 18 and older must present a valid identification with photograph, such as a driver's license or passport. International visitors to the rocket engine test facility must provide a valid passport.

Photos: (Top) Students enjoy a presentation at the Science on a Sphere exhibit at StenniSphere. (Above right) StenniSphere visitors in the mock cockpit exhibit try their hands at "landing" the space shuttle safely. (Above left) A Stennis family enjoys an afternoon of StenniSphere activities.

50 years of excellence

stennis space center

Since the 1960s, America's manned space program has ridden on rocket engines tested and proven flight-worthy at Stennis Space Center. Established to test the Saturn V rocket engines and stages that carried humans to the moon, the south Mississippi facility has evolved to become a sprawling federal city home to federal, state, academic and private organizations and several technology-based companies. The facility has been known by several names, has been led by 12 directors and has witnessed a number of historic moments.

May 25, 1961 President John F. Kennedy sets a goal of sending humans to the moon by the end of the decade.

Oct, 25, 1961 NASA announces its decision to establish a national rocket test site in Hancock County, Mississippi.

May 17, 1963 Workmen cut first tree to start construction of Stennis.

April 23, 1966 First Saturn V rocket booster (S-II-T) is tested at Stennis.

Sept. 9, 1970 NASA announces Earth Resources Laboratory will locate at Stennis.

March 1, 1971 NASA announces Stennis will test space shuttle main engines.

May 19, 1975 Stennis conducts first space shuttle main engine test, beginning a series that will last 34 years and involve all of the major test stands at times.

May 28, 1976 Flag-raising ceremony marks the official move of the Naval Oceanographic Program to Stennis.

April 21, 1978 Stennis conducts first system test of the Space Shuttle Main Propulsion Test Article, which consists of three shuttle main engines in launch configuration fired simultaneously.

Feb. 25, 1988 Stennis conducts 1,000th test firing of space shuttle main engine.

Jan. 18, 1989 Construction begins on the Component Test Facility to test turbopump machinery for rocket propulsion systems. The facility is now the versatile E Test Complex, with seven test cells capable of supplying ultra high-pressure gases and cryogenic fluids.

Aug. 20, 1990 For the first time, space shuttle main engine tests are conducted on all three test stands in one day.

Dec. 30, 1991 NASA administrator designates Stennis Space Center as the Center of Excellence for large propulsion system testing.

July 24, 1992 Stennis conducts its 2,000th space shuttle main engine test.

May 30, 1996 NASA designates Stennis Space Center as the lead center to manage agency capabilities and assets for rocket propulsion testing.

Feb. 21, 1997 Stennis is designated NASA's lead center for implementing commercial remote sensing activities.

Aug. 5, 2002 Ribbon cutting ceremonies are held for three new facilities at Stennis, collectively valued at more than $60 million. They include the Lockheed Martin Mississippi Space and Technology Center, the Naval Small Craft Instructional and Technical Training School and Special Boat Unit TWENTY-TWO, and the Naval Oceanographic Office Warfighting Support and Survey Operations Center.

Jan. 21, 2004 The space shuttle main engine achieves a significant milestone during a Stennis test – 1 million seconds of test and flight operations.

Aug. 11, 2005 Stennis celebrates the 30th anniversary of space shuttle main engine testing at the facility.

Aug. 29, 2005 Hurricane Katrina makes landfall, with its eye passing directly over Stennis Space Center.

April 21, 2006 Stennis marks the 40th anniversary of the facility's first engine test.

May 8, 2007 NASA announces the decision to build a new test stand at Stennis for simulated high-altitude testing of next-generation rocket engines. Ground is broken for the project on August 23, 2007.

Dec. 18, 2007 Stennis conducts "chill test" on the A-1 Test Stand to begin an initial series of tests on Powerpack 1A, to be used on the next-generation J-2X rocket engine being developed to carry humans into deep space.

Oct. 22, 2008 Stennis conducts a flight certification test on space shuttle main engine No. 2061, installed on the A-2 Test Stand. It is the last space shuttle main flight engine to be built for the Space Shuttle Program.

April 9, 2009 Structural steel work is completed on the A-3 Test Stand. The stand is scheduled for activation in 2013

July 29, 2009 The last scheduled test of a space shuttle main engine is conducted at the A-2 Test Stand.

Nov. 10, 2010 Stennis conducts the first successful test firing of the Aerojet AJ26 engine for Orbital Sciences Corporation, which has partnered with NASA to provide cargo space flights.

July 14, 2011 Stennis conducts ignition test on new J-2X rocket engine, marking the third major testing series for the historic A-2 Test Stand. The J-2X engine is being developed as a next-generation rocket engine that could carry humans into deep space again.

stennis @ 50

stennis space center

Historical facts

- NASA announced plans to open a rocket engine test facility in Hancock County on Oct. 25, 1961.
- Construction of Stennis facilities necessitated relocation of 660 families to other areas.
- Tree-cutting for construction of rocket engine test facilities at Stennis began May 17, 1963.
- At the height of construction of Stennis facilities in the 1960s, some 6,100 employees were on-site with 30 prime and 250 subcontractor companies.
- Rocket scientist Dr. Wernher von Braun affirmed the importance of Stennis by stating, "I don't know yet what method we will use to get to the moon, but I do know that we have to go through Mississippi to get there!"
- NASA first called its test facility Mississippi Test Operations, then Mississippi Test Facility and National Space Technology Laboratories. On May 20, 1988, President Ronald Reagan named the site in honor of U.S. Sen. John C. Stennis of Mississippi.

Stennis Space Center

- Stennis features seven-and-a-half miles of canal waterways, which include a lock-and-dam system to transport large rocket stages and cryogenic barges to and from the Gulf of Mexico via the Pearl River.
- All Stennis facilities are located within a 13,800-acre "fee" area owned by the federal government. The Stennis fee area is surrounded by a 125,000-acre noise buffer zone designated a national asset.
- In April 2008, the American Institute of Aeronautics and Astronautics named Stennis a historic aerospace site.
- Stennis facilities have been affected by numerous tropical storms, including three major hurricanes – Hurricane Betsy in 1965, Hurricane Camille in 1969 and Hurricane Katrina in 2005.
- The StenniSphere visitor center and museum features informative and interactive exhibits, including a moon rock and space program artifacts.
- Each year, the StenniSphere visitor center and museum hosts more than 36,000 visitors on tours.
- In 2009, Stennis unveiled an "all hazards network" system (HazNet) that provides comprehensive information in emergency situations. Developed through NASA's Innovative Partnerships Program, the system has been adopted at all NASA centers, as well as by several area communities.

Propulsion testing

- Stennis is America's largest rocket engine test facility, with test structures valued at more than $2 billion.
- NASA's Rocket Propulsion Test Program Office at Stennis manages test facilities across the agency.
- The three major test stands at Stennis are the single-position, vertical-firing A-1 and A-2 tests stands, and the dual-position, vertical-firing B-1/B-2 Test Stand. The versatile three-stand E Test Complex includes seven separate cells capable of various test activities.
- Stennis is among the world's largest consumers of liquid hydrogen – a primary fuel in rocket propulsion testing.
- On Aug. 8, 1998, all four test positions at Stennis were occupied for the first time in the center's history.

Apollo Program

- First- and second-stage Saturn V rocket boosters for NASA's Apollo Program were tested at Stennis, including those that propelled humans to the moon on seven lunar missions from 1969 to 1972.
- Stennis engineers conducted the first rocket engine test at the facility on April 23, 1966, a 15-second firing of a Saturn V second stage prototype (S-II-C).
- During the Apollo Program years, Stennis engineers conducted 45 test firings. The accumulated experience of the test team members amounted to 2,475 man-years of rocket engine test expertise.
- The Stennis team tested 27 Saturn V rocket stages in the Apollo years. All that were launched performed their missions without failure.

Space Shuttle Program

- Stennis engineers conducted the first full-duration test of a space shuttle main engine June 24, 1975.
- All of the main engines used on 135 space shuttle flights were tested at Stennis. Every modification and configuration of space shuttle main engines also weas tested and proven flight-worthy at Stennis before being used on a mission.
- In April 1978, Stennis conducted the first test of the Space Shuttle Main Propulsion Test Article with three main engines configured as they are on a space shuttle orbiter during flight. All three main engines were fired simultaneously on the B-2 Test Stand to prove the space shuttle propulsion system flight-worthy. Many consider the propulsion system testing as one of Stennis' finest hour.
- Space shuttle main engines at Stennis were test fired for about eight-and-one-half minutes (520 seconds), the amount of time the engines must fire during an actual flight.
- On Aug. 20, 1990, for the first time ever, space shuttle main engines were tested on all three large test stands in a single day.
- The 1 millionth second of space shuttle main engine firing was recorded at Stennis on Jan. 24, 2004, during a test conducted on the A-2 Test Stand.
- Stennis conducted the last scheduled test of a space shuttle main engine on July 29, 2009.

Current and future testing

- In 1998, Stennis partnered with Pratt & Whitney Rocketdyne to test RS-68 engines used for Delta IV rocket launches. It marked the first long-term commitment to allow Stennis rocket engine test facilities to be used for commercial purposes. Pratt & Whitney Rocketdyne continues to test RS-68 engines on the site's B-1 Test Stand.
- In 2007, Stennis broke ground for construction of the A-3 Test Stand, the first large test facility to be built on-site since the 1960s.
- The new A-3 Test Stand at Stennis will be the only test stand in the country with the combined capabilities to conduct long-duration tests on full-scale engines at simulated altitudes up to 100,000 feet, and to gimbal, or rotate, the engines during the test as they would operate during flight.
- In 2010, Stennis Space Center partnered with Orbital Sciences Corporation to test Aerojet AJ26 rocket engines that will power commercial cargo flights to the International Space Station.

Federal city

- Stennis is a federal city, home to about 30 federal, state, academic and private organizations and several technology-based companies. The entities share the cost of owning and operating the south Mississippi facility, making it more cost-effective for each one to accomplish its independent mission.
- Since 1998, the U.S. Navy has conducted training for the Special Boat Team TWENTY-TWO special ops riverine force on Stennis waterways.
- Stennis is home to the largest concentration of oceanographers in the world.

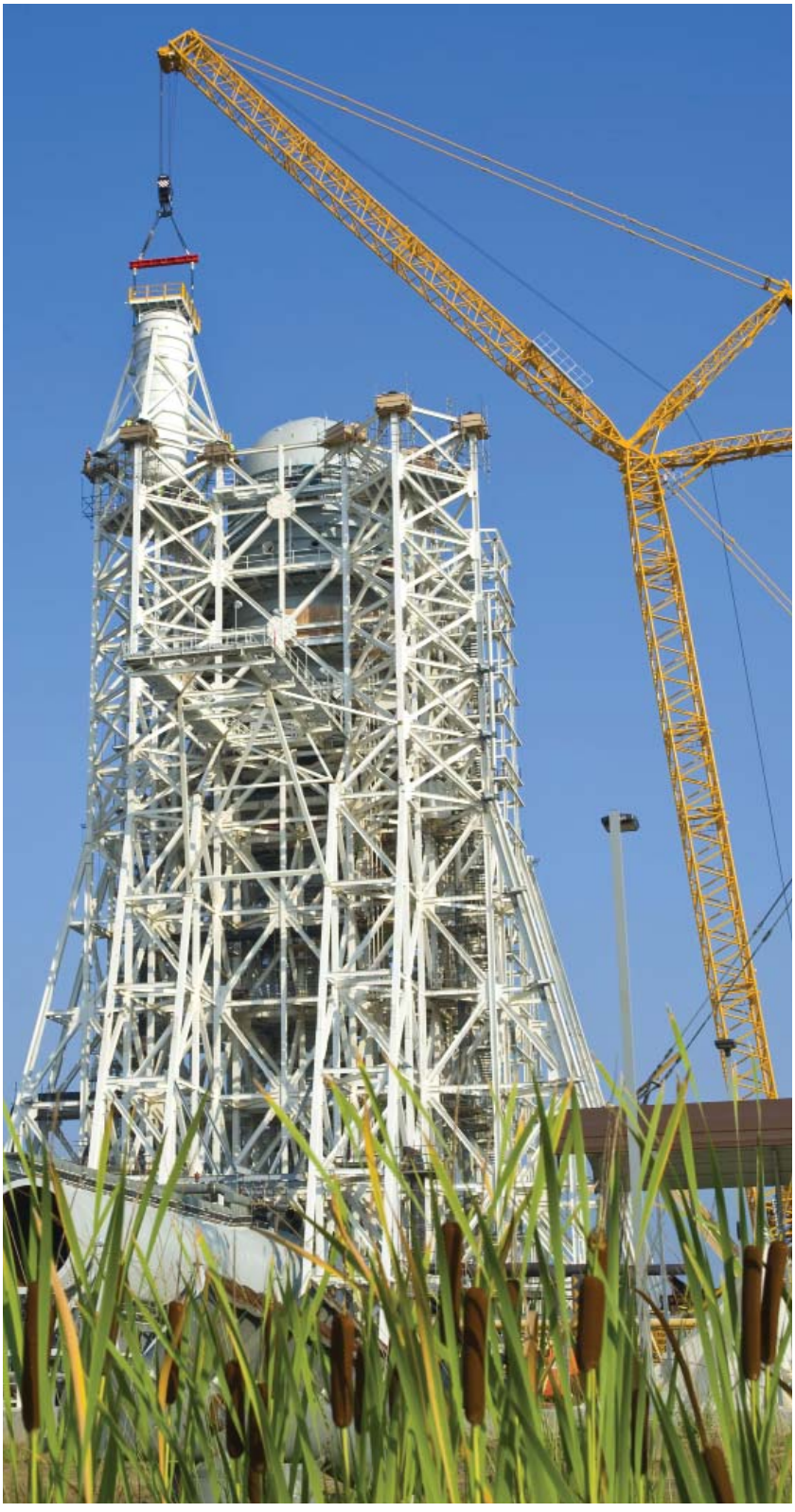
A-3 test stand

stennis space center

More than two decades after the last Apollo mission to the moon, there is consensus that the time has come for the United States to travel beyond low-Earth orbit once more. Whatever forms those plans take, NASA's John C. Stennis Space Center is preparing to play a central role.

In anticipation of that role, NASA announced in May 2007 that it would build a new stand at Stennis for testing next-generation rocket engines that will carry humans beyond low-Earth orbit once more. As the first major test structure constructed at Stennis since the 1960s, the new A-3 stand will allow operators to test engines at simulated altitudes of up to 100,000 feet. Such testing is critical, since engines that carry humans beyond low-Earth orbit must be able to fire in space.

When activated in 2013, the A-3 stand will have unique capabilities. It will allow operators to conduct full-duration tests (the amount of time engines have to fire during an actual flight) on full-scale engines and to gimbal the engines (rotate them in the same way they must move during flight in order to ensure proper trajectory), all at simulated high altitudes. No other test stand in the country allows all of those aspects at such simulated altitudes at the same time.



timeline

stennis space center

May 25, 1961 ... President John F. Kennedy challenges the United States to send humans to the moon and return them safely by the end of the decade.

July 1, 1965 ... NASA renames its Mississippi Test Operations site the Mississippi Test Facility.

July 29, 1969 ... Astronaut Neil Armstrong becomes the first human to set foot on the moon. His Apollo 11 mission is powered by first- and second-stage Saturn V rocket boosters tested at the Mississippi Test Facility.

March 1, 1971 ... As the Apollo Program ends, NASA assigns responsibility for testing space shuttle main engines to the Mississippi Test Facility.

May 28, 1976 ... A flag-raising ceremony marks official move of the Naval Oceanographic Program to National Space Technology Laboratories.

June 14, 1974 ... The Mississippi Test Facility is renamed National Space Technology Laboratories.

April 21, 1978 ... The first test of the Space Shuttle Main Propulsion Test Article is conducted, which involves simultaneously firing three space shuttle main engines arranged in flight configuration.

Feb. 25, 1988 ... Operators at National Space Technology Laboratories conduct the 1,000th test firing of a space shuttle main engine.

May 1, 1994 ... Management of the space shuttle main engine test operations program is transferred from NASA's Marshall Space Flight Center in Huntsville, Ala., to Stennis Space Center.

Dec. 30, 1991 ... NASA designates Stennis as the Center of Excellence for large propulsion system testing.

Jan. 21, 2004 ... A test firing at Stennis marks 1 million seconds of space shuttle main engine test and flight operations.

Feb. 21, 1997 ... Stennis is designated as NASA's lead center for implementing commercial remote sensing activities.

Aug. 8, 1998 ... All four test stands – A-1, A-2 and B-1/B-2 – are occupied for the first time.

Aug. 11, 2005 ... Stennis marks 30 years of space shuttle main engine testing with an afternoon firing on the A-2 Test Stand.

Sept. 29, 2006 ... The final space shuttle main engine test on the A-1 Test Stand is conducted. In early November, the stand is officially handed over to begin testing the next-generation J-2X engine.

May 8, 2008 ... Stennis engineers successfully complete an initial series of tests on Powerpack 1A, which is a key component of the next-generation J-2X rocket engine in development.

July 29, 2009 ... The final space shuttle main engine is tested at Stennis Space Center, ending 34 years of testing flight engines for 135 shuttle missions.

Aug. 11, 2011 ... The visit of the STS-135 space shuttle Atlantis crew marks the close of NASA's Space Shuttle Program for Stennis Space Center. The crew returned to Earth on July 21, completing the final flight in the 30-year shuttle program.

Oct. 22, 2008 ... Stennis' A-2 Test Stand team conducts a final certification test on engine No. 2061, the last space shuttle main flight engine scheduled to be built.

Aug. 2010 ... The Stennis Education Office develops Mass vs. Weight, its first-ever teaching curriculum. It offers a series of hands-on activities for grades 5-8 to help educate students about mass and weight concepts. A year later, in support of the new curriculum, Stennis hosts area students to dialogue with International Space Station astronauts during the facility's first-ever live video feed from the orbiting ISS.

May 2011 ... The Stennis Applied Science and Technology Project Office provides invaluable satellite data on water and sediment flow after Louisiana officials open the Morganza and Bonnet Carre spillways to control Mississippi River flooding.

Oct. 25, 1961 ... NASA publicly announces plans to build a rocket engine test facility in Hancock County. On Dec. 18, the facility is officially named Mississippi Test Operations.

May 17, 1963 ... Construction workers cut the first tree to start clearing an area for NASA's new rocket engine test facility.

April 23, 1966 ... The space age arrives in Hancock County as operators at NASA's Mississippi Test Facility conduct the first-ever Saturn V rocket booster (S-II-T) test on the A-2 Test Stand.

Sept. 9, 1970 ... NASA announces its Earth Resources Laboratory will be located at the Mississippi Test Facility.

March 1978 ... Earth Resources Laboratory Applications Software is developed at National Space Technology Laboratories and implemented worldwide.

May 19, 1975 ... The first-ever space shuttle main engine is test-fired at National Space Technology Laboratories.

April 12, 1981 ... Columbia launches from Kennedy Space Center on the first flight of NASA's Space Shuttle Program. It is powered by three main engines tested at Stennis.

May 20, 1988 ... National Space Technology Laboratories is renamed the John C. Center Space Center to honor the longtime U.S. senator from Mississippi who was instrumental in establishment and growth of the rocket engine test facility.

July 24, 1992 ... Stennis conducts its 2,000th test firing of a space shuttle main engine.

Aug. 20, 1990 ... Space shuttle main engine tests are conducted for the first time on all three Stennis test stands on the same day.

May 30, 1996 ... NASA designates Stennis as its lead center to manage capabilities and assets for rocket propulsion testing.

Aug. 5, 2002 ... Ribbons are cut on three new Stennis facilities, valued at more than $60 million – for Lockheed Martin, the U.S. Navy and the Naval Oceanographic Office.

Aug. 29, 2005 ... Hurricane Katrina makes landfall, battering southeast Louisiana and the Mississippi Gulf Coast. Tracking maps show the storm's eye passing directly over Stennis Space Center, inflicting damage to several facilities. After the storm, Stennis serves as key relief/recovery location for area residents.

July 27, 1998 ... Activation is initiated on the E-1 Component Test Facility, a world-class, high-pressure cryogenic test structure at Stennis Space Center.

April 21, 2006 ... A space shuttle main engine test marks the 40th anniversary of rocket engine testing at Stennis Space Center.

Aug. 23, 2007 ... NASA officials and government leaders break ground for construction of the A-3 Test Stand, the first large test structure to be built at the facility since the 1960s.

April 9, 2009 ... Structural steel work is completed on the A-3 Test Stand, marking final assembly of four million pounds and 16 stages of fabricated steel on the test stand foundation.

June 2, 2009 ... NASA officials and visiting dignitaries open the new Emergency Operations Center at Stennis Space Center to house the facility's medical clinic, fire department, security services, energy management control system and incident command post.

Nov. 10, 2010 ... Stennis conducts first successful test of the Aerojet AJ26 engine for Orbital Sciences Corporation. The engines will power commercial cargo transport flights to the International Space Station.

July 26, 2011 ... Stennis operators conduct a successful ignition test of the next-generation J-2X rocket engine. The test signals launch of the third major test series on the historic A-2 Test Stand.

May 2, 2011 ... The main administration building at Stennis Space Center is named in memory of late site Director Roy S. Estess.

and the journey continues ...

resident agencies

stennis space center

Government Agencies

NASA

In addition to administrative and Rocket Propulsion Test Program offices, Stennis is home to the NASA Shared Services Center, which provides agencywide, state-of-the-art administrative processing services and customer contact center operations.

Department of Defense

Stennis is home to the U.S. Navy's Meteorology and Oceanography Command, Oceanographic Office, Research Laboratory Detachment, Small Craft Instruction and Technical Training School and Special Boat Team TWENTY-TWO unit.

Department of Commerce

The U.S. Department of Commerce maintains the National Data Buoy Center National Weather Services office at Stennis, as well as the National Coastal Data Development Center and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service office.

Department of the Interior

The U.S. Geological Survey Hydrologic Instrumentation Facility supports hydrologic data collection activities of USGS scientists in all 50 states, Puerto Rico and other U.S. territories. The support includes evaluation and testing of hydrologic instruments and equipment, technical support, training, and instrument acquisition, rental and repair services. The facility's Hydraulic Laboratory, environmental testing chambers, water quality lab, training room, repair shop, warehouse and testing pier on the Pearl River.

Environmental Protection Agency

The U. S. EPA, Office of Pesticide Programs, Biological and Economic Analysis Division's Environmental Chemistry Laboratory provides analytical support for the analyses of foods, as well as environmental and various other samples.

State of Mississippi

The Mississippi Enterprise for Technology Inc. is a private non-profit corporation to facilitate regional economic development by leveraging the resources of Stennis Space Center, the state, and the region to foster business opportunities among public and private entities. MSET operations at Stennis include a small business incubator for young technology businesses and the Mississippi Technology Transfer Office.

State of Louisiana

The Louisiana Business & Technology Center at LSU maintains a Technology Transfer Office at Stennis whose primary mission is to link small businesses and universities with the resources of federal labs, such as NASA at Stennis Space Center.

Education

Center of Higher Learning

Five institutions operate the Center of Higher Learning at Stennis Space Center – Mississippi State University, Pearl River Community College, the University of New Orleans, the University of Southern Mississippi and the University of Mississippi.

Mississippi State University

The Mississippi State University Science and Technology Center houses the Northern Gulf Institute Program Office, MSU faculty and staff, and the National Oceanic and Atmospheric Administration's National Coastal Data Development Center. The MSU personnel focus on atmospheric and ocean science, food safety, and critical ecosystem, watershed, and coastal management issues.

University of Southern Mississippi

A USM facility at Stennis supports the school's Department of Marine Science in the College of Science & Technology. The USM Department of Marine Science provides graduate and undergraduate education as well as basic and applied research in the fields of physical oceanography, geological oceanography, biological oceanography, marine chemistry and hydrographic science.

Major Contractors

A^2Research

A^2Research provides laboratory services for NASA and other resident agencies at Stennis through its Measurement Standards and Calibration Laboratory and Science Laboratory. Its work encompasses such areas as calibration, repair, metrology engineering, scientific and environmental services.

ASRC Research and Technology Solutions

ARTS is an engineering, research and technology services company, which partners with Stennis and other facilities to support a range of missions, including aeronautics, aviation, information technology management, and Earth and space sciences.

Jacobs Technology Inc.

Jacobs is responsible for the Facility Operating Services Contract at Stennis, which provides administrative, facility engineering, construction management, food, mail, fire protection, custodial, multimedia, public affairs, education, facility maintenance and operations, safety, quality and environmental, medical and occupational health, procurement, and logistics and transportation services.

Lockheed Martin

Lockheed Martin is a global security company principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The company provides test operations support at Stennis Space Center.

Paragon Systems Inc.

Paragon provides comprehensive facility security services and licensed, professionally trained service personnel to departments and agencies of the U.S. government, including Stennis Space Center. The company employs more than 4,700 security specialists at more than 600 U.S. federal facilities.

Pratt & Whitney Rocketdyne

PWR maintains an engine assembly facility at Stennis, which will be used to prepare RS-25 D/E and J-2X rocket engines for testing and eventual use on NASA's new Space Launch System vehicle. PWR also assembles the RS-68 rocket engines at the engine assembly facility and leases the B-1 Test Stand at Stennis to test these engines, which are used on Delta IV launches for the U.S. Department of Defense.

Science Applications International Corp.

SAIC is a scientific, engineering and technology applications company focused on issues related to national security, energy and the environment, critical infrastructure and health.

Rolls-Royce North America

Rolls-Royce opened its jet engine test facility at Stennis in 2007. The facility is used to test development and prototype jet engines for performance, noise, validation of safety systems and other factors. It is the first Rolls-Royce test facility of its kind outside the United Kingdom and the first built from the ground up in the United States.

helpful websites

stennis space center

National Aeronautics and Space Administration

www.nasa.gov
Gain access to the NASA Image of the Day, mission information, video feeds, NASA blogs and much more regarding the American space program.

www.nasaimages.org
Search photograph database for images related to the universe, the solar system, Earth, aeronautics and astronauts.

John C. Stennis Space Center

www.nasa.gov/centers/stennis/home/index.html
Gain access to the latest news and information about work at Stennis Space Center.

www.ssc.nasa.gov/~sirs/
Browse the Stennis Image Retrieval System for photographs related to Stennis Space Center work, events and history.

Education Office

www.nasa.gov/centers/stennis/education/index.html
Access the gateway to information about various NASA education programs and opportunities.

http://education.ssc.nasa.gov/astrocamp.asp
Obtain information about Astro Camp activities, including schedule and registration policy.

StenniSphere visitor center

www.ssc.nasa.gov/public/visitors
Gather information on the visitor center operating hours, take a virtual tour of the museum or book a group tour online.

NASA jobs

http://usajobs.opm.gov
Use keywords and locations to search a database of job vacancies at all or selected federal agencies.

http://intern.nasa.gov
Learn about NASA student research opportunities, internships, fellowships and scholarships.

http://nasajobs.nasa.gov
Learn about NASA job vacancies and career development opportunities and how to apply.

http://nasajobs.nasa.gov/studentopps/employment/default.htm
Gather information on NASA student programs and opportunities, including how to apply.

http://www.nasa.gov/centers/stennis/about/jobs/index.html
Access information about job vacancies at all major resident agencies located at Stennis Space Center.